Journal of Contemporary Issues in Business and Government Vol. 29, No. 03, 2023
https://cibgp.com/

P-ISSN: 2204-1990; E-ISSN: 1323-6903

IMPACT OF EXPORTS ON ALGERIA'S BALANCE OF TRADE STANDARD STUDY 1991-2021

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Received 06/2023 **Published 09/2023**

ABSTRACT

This study aims to illustrate the impact of exports on the Algerian trade balance for the period 1991-2021, using Johansson cointegration method, Granger causality test, and estimating the relationship according to the normal micro-square method.

The study revealed the existence of a long-term balance between the trade balance and exports, inflation and oil prices, and a lack of causal correlation between them in both directions, with a correlation between exports, oil prices and the trade balance; however, there is an inverse relationship between inflation and the trade balance which is consistent with the economic theories.

Keywords: Exports, Trade Balance, Johansson cointegration method, Granger Causality Test, Normal Micro-square Method.

1- INTRODUCTION:

Foreign trade plays a pivotal role in shaping the economic landscape of nations worldwide. It serves as a reflection of a country's external openness, independence, economic interdependence, and competitiveness. One of its primary objectives is to maintain balanced trade equilibrium and mitigate imbalances, whether in the form of deficits or surpluses.

Algeria's foreign trade trajectory has traversed various stages, ranging from stringent restrictions to phased liberalization and eventually embracing more comprehensive liberalization. However, despite these shifts, the country's trade balance has oscillated between deficits and surpluses, closely intertwined with fluctuations in oil prices due to its rentier nature. Consequently, this dynamic has significantly influenced Algeria's economic stability, notwithstanding the reforms implemented to diversify exports and gradually reduce reliance on oil exports. Efforts to curtail imports have been bolstered by initiatives aimed at supporting and incentivizing domestic production.

This research seeks to examine how exports have influenced Algeria's trade balance between 1991 and 2021. It employs widely recognized economic methodologies like the Johansen co-integration test, Granger causality test, and the normal micro-square method. Through these analytical tools, the study aims to demonstrate the relationship between exports and Algeria's trade balance over the specified period. By employing standard economic techniques, the research aims to shed light on

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the factors impacting Algeria's trade dynamics and contribute to a deeper understanding of its economic trends.

1-1 Study Problem:

The main problem of the study is: What is the impact of exports on Algeria's trade balance throughout the period from 1991 to 2021?

- **Sub-problems:**

The following sub-problems are included:

- ✓ What characterizes the relationship between Algeria's exports and trade balance from 1991 to 2021?
- ✓ Does a causal relationship exist between Algeria's exports and trade balance during the period from 1991 to 2021?
- ✓ What direction characterizes the relationship between exports and the trade balance in Algeria from 1991 to 2021??

- **Study hypotheses:**

The following hypotheses were formulated in response to the issues identified previously:

- ✓ There has been a long-term balance between exports and the trade balance in Algeria from 1991 to 2021;
- ✓ There is a causal relationship between exports and Algeria's trade balance from 1991 to 2021.
- ✓ There is an inverse correlation between exports and the deficit in the trade balance, as well as a correlation between exports and a surplus in the trade balance in Algeria for the period 1991-2021.

1-2 Objectives of the study:

Through the study, the following objectives are sought to be achieved:

- ✓ Provide a thorough explanation of exports and the balance of trade, elucidating their theoretical relationship.
- ✓ Examine Algeria's exports profile and evaluate the trajectory of its trade balance from 1991 to 2021.
- ✓ Develop a standard model to assess how exports have influenced Algeria's balance of trade during the period spanning from 1991 to 2021

1-3 Importance of the study:

The study of foreign trade holds significance within the realm of economic growth, particularly concerning Algeria's export sector, which plays a pivotal role in shaping the country's balance of trade and fostering economic development, both directly and indirectly. By generating foreign currency revenue, the export sector bolsters investments in the industrial sector, thus stimulating growth. Additionally, it facilitates the expansion of markets for domestic products, thereby fostering the growth of other economic sectors.

2- Study methodology:

To align with the study's aims, an analytical descriptive approach was adopted as it best suits the examination of economic phenomena, specifically the influence of exports on the balance of trade. Statistical methodologies were employed to construct a suitable model for quantifying this impact, incorporating various economic variables pertinent to Algeria from 1991 to 2021. The Eviews 9 software was utilized for data analysis and model development.

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3- Previous studies:

Possessing a series of prior studies pertinent to the subject matter, these will be referred to for insights and reference.

- **First study:** Mohammed Atallah Alimat, Ibrahim Bataina (2018), entitled**: "The impact of agricultural exports on the Jordanian trade balance",** article published in the World Journal of Economics and Business, vol. 04, No. 03, Jordan.

The study aimed to demonstrate the influence of agricultural exports on Jordan's trade balance from 2006 to 2017, employing the simple linear regression model to test its hypothesis. It discovered a statistically significant positive impact of agricultural exports on Jordan's trade balance, attributing this to a correlation where lower trade balance deficits corresponded with higher agricultural exports. The study's recommendations included the removal of barriers to production and export, incentivizing investment, and attracting capital by establishing free zones for agricultural production and food industries. Similarities were observed in the treatment of exports and trade balance, the utilization of Johansson's method for joint integration testing, and the causation test for Granger. Differences were identified in the use of the normal micro-square method, economic variables, and the spatial and temporal scope of the study.

- **Study II:** Raq Ali Warak Nasir and Mohammed Saleh Hassan (2022) study entitled: **"The impact of livestock exports on the trade balance in the Sudan during the period 1990-2018 using the ARDL model",** article published in the Journal of Economics and International Trade, vol. 04, No. 01, Algeria.

The study aimed to assess the impact of livestock exports on Sudan's balance of trade between 1990 and 2018, employing descriptive, analytical, and quantitative analysis methods. Through the Bound test, it determined that the variables were integrated in the long term. Additionally, the error correction model indicated that short-term errors were corrected to achieve long-term balance, with interpreted variables affecting the dependent variable. Recommendations included initiatives to care for and rehabilitate breeds, focus on market development and export specifications, and promote livestock production projects by eliminating duties and taxes. Similarities were found in the treatment of exports and trade balance, as well as in the Granger causation test. However, differences arose in the utilization of the ARDL model, the error correction model, economic variables, and the study's spatial and temporal scope.

4- Conceptual framework for exports and trade balance:

Exports: by addressing the concept of exports, their methods, types and importance.

Export Concept:

- Defined as: **"***The sale of a particular basket from its production centres to its marketing centres, or by another expression from one of the markets for which the basket represents surplus production to another market for which the same commodity is part of its needs***».** (Mustafa, 1993, p. 235)

Export Methods: For export, two methods are:

- Direct export: where a direct relationship between the producing and exporting enterprise is required at the same time, without the use of intermediaries' services. (Yassin, 2002, p. 38)

- Indirect export: An enterprise sells its products to a local beneficiary who exports the product to markets abroad, whether the product is original or modified. (Yassin, 2002, pp. 38-39)

Types of Exports:

- Foreseeable exports: includes exports of tangible material goods from a State's residents to overseas residents across customs borders with the consent of customs authorities. (Bakri, 2002, p. 28)

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- Invisible exports: services performed by individuals and institutions for foreigners . (Haddad, 1995, p. 139)
- Temporary exports: goods or funds exported abroad for a specified period of time, to be re-imported. (Qassum, 2008, p. 13)
- Final exports: those goods and services that are permanently exported. (Belkalah, 2009, p. 89)
Importance of exports:
The importance of export lies in:
- Create new employment opportunities;
- Reform of the balance-of-payments deficit;
- Attracting domestic and foreign investors;
- Raising economic growth rates. (Averet, 1988, p. 224)

Trade Balance:
The concept of trade balance, its significance, equilibrium, and imbalance, as well as the underlying causes of its imbalance, are crucial aspects to address in economic analysis.
Trade Balance Concept:
- The balance of trade is defined as: **"***A branch of the balance of payments, it restricts all commercial transactions of import and export goods and services Between one State and another, we say that there is a surplus in the balance of trade if exports of goods and services exceed imports of goods and services, and we say that there is a deficit in the balance of trade if imports of goods and services exceed the volume of exports of tuberculosis and services* **".** (Sarbiti, 2009, p. 231)
Balance and imbalance in the trade balance:
Balance in the balance of trade means the value of both the creditor side and the value of the debtor side of the balance of trade, i.e. the liabilities of other States are equal to their rights vis-à-vis the outside world (Khalaf, international finance, 2004, pp. 124-125), as a result of which exchange rates stabilize, thus achieving economic balance both internally and externally.

The imbalance in the balance of trade occurs when the value of the creditor side exceeds the value of the debtor side in the balance of trade and vice versa, when the State's rights exceed its demands in other States. This situation is called a surplus in the balance of trade.

The reasons for the imbalance in the trade balance are limited to:
- ✓ Erroneous valuation of the exchange rate;
- ✓ Indicators of the structure of foreign trade;
- ✓ The volatility of the State's economic cycles;
- ✓ Capital economic crises affecting developing countries;
- ✓ Impediments to tariff and non-tariff restrictions on foreign trade;
- ✓ Natural factors;
- ✓ Technological development;
- ✓ Political Situation of States. (Giddle & Derdori, 2021, pp. 79-81)

Factors affecting the balance of trade:
- Rate of economic growth: they have a foreign relationship whenever there is a surplus in the balance of trade, hard currency is available, output is higher and the rate of economic growth is higher (al-Gaysh, 2021, p. 260)
- Exchange rate: There is an inverse relationship between them. The higher the exchange rate, imports rise and trade balance deficits occur. (Doha, 2015, p. 150)
-Population growth: As the population increases, it becomes a consumer force, domestic production must be raised or imports increased. Trade balance deficits will occur. (al-Gaysh, 2021, p. 262)

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- **Inflation:** Because of which the local currency depreciates against foreign currencies, imports rise and trade deficits occur. (Khador, 2015, p. 126)
- **International reserves**: the lower the trade balance deficit, the higher the international reserves of external assets available to the state's monetary authority. (al-Gaysh, 2021, p. 264)
- **Oil price:** higher oil prices are reflected on the trade balance by higher exports to cover imports and achieve surpluses and vice versa.
- **External indebtedness**: Rising trade balance deficits increase external indebtedness to finance imports. (Azzazi, 2010, p. 51)

Importance of the Balance of Trade:

Foreign trade is crucial because a country with a surplus trade balance exports more than it imports, indicating high production volumes and competitive merchandise prices, which help it sweep both national and international markets. This, in turn, boosts production and operational levels, increasing macro-expenditure to drive the economy and achieve high growth rates, making the balance of trade extremely important within the economic process.. (Ben Masood & al-Hadi, 2020, p. 207)

Relationship of exports to the balance of trade:

The surplus in the state's balance of trade leads to a rise in its currency exchange rates, which in turn raises the price of its exports compared to the prices of goods produced by other states. This adversely affects its exports, domestic production, income, and employment, leading to a continued rebalancing through declining exports and increasing imports. (Doha, 2015, p. 120)

The achievement of a surplus in the State's balance of trade in appropriate economic conditions is an indication of the robustness of its economic status, the employment of all its economic resources and the achievement of economic development through export development, as well as its achievement in inadequate economic conditions by restricting imports, are evidence of its success in applying a short-term policy that increases the imbalance in domestic economic activity. (Abd al-Rahman, 1993) (Abd al-Rahman, 1993, p. 207)

The trade balance deficit of underdeveloped States for development is further exacerbated by their growing need to import capital goods, intermediate goods and consumer needs, which, while they are necessary for the establishment of productive enterprises, do not produce them, creating trade balance deficits. (Khalaf, International economic relations, 2001)

Orientation of Algeria's Export Development and Trade Balance 1991-2021:

The following table presents the evolution of both Algeria's exports and trade balance for the period 2021-1991.

Table 01: Evolution of Algeria's exports and trade balance for 1991-2021.

Unit: Million DZ

Balance of Trade	Exports	Year	Balance of Trade	Exports	Year
2 297 334	4 214 163	2007	94 348	233 589	1991
2 522 986	5 095 020	2008	60 463	249 010	1992
492 831	3 347 636	2009	34 517	239 552	1993

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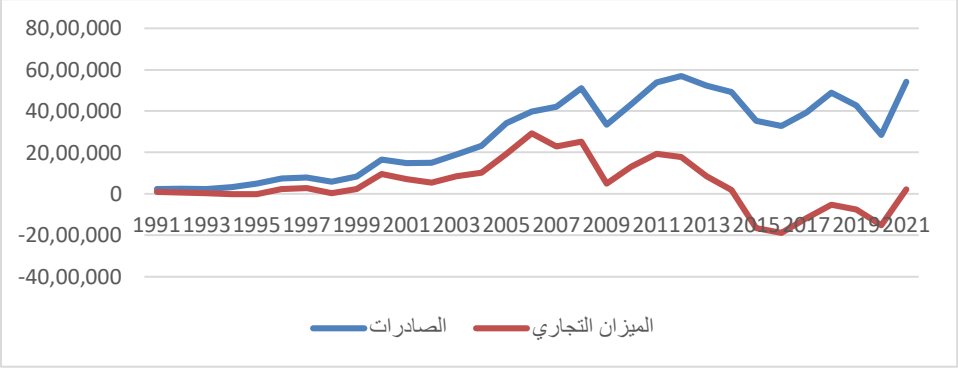
1 321 780	4 333 587	2010	-15 804	324 338	1994
1 931 630	5 374 131	2011	-14 742	498 451	1995
1 780 298	5 687 369	2012	242 485	740 811	1996
848 551	5 217 100	2013	290 188	791 768	1997
197 890	4 917 598	2014	36 517	588 876	1998
-1 656 273	3 537 187	2015	229 844	840 517	1999
-1 877 060	3 277 716	2016	966 790	1 657 216	2000
-1 183 002	3 928 296	2017	715 473	1 480 336	2001
-513 954	4 889 279	2018	544 152	1 501 192	2002
-745 188	4 271 649	2019	854 612	1 902 054	2003
-1 517 282	2 846 371	2020	1 023 048	2 337 448	2004
219 733	5 404 713	2021	1 927 904	3 421 548	2005
			2 420 460	3 979 001	2006

Source: Prepared by the researcher on the sites of the National Statistical Office and the World Bank.

The following figure represents the development of Algeria's double deficit and economic growth for the period 1991-2021.

Figure (01): Evolution of Algeria's exports and trade balance for 1991-2021



Source: Prepared by the researcher based on table (01).

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By tracking Algeria's export developments and trade balance, we can track its passage through the following stages:

- Period 1991-1999:
The trade balance achieved a surplus for the years 1991-1993, and 1991 saw the largest surplus + 94.348 million DZ and exports estimated at 233.589 million DZ, The 1994-1995 deficit saw the largest deficit for 1994 with 15.804 million DZ with exports of 324.338 million DZ and 1997-1999 achieved a surplus with the largest surplus for 1999 of + 36.517 million DZ with exports estimated at 840.517 million DZ, The phase saw oil prices rise in international markets during the Gulf War and the characteristic turmoil of the oil market caused by the Asian tiger crisis in Southeast Asia in 1998.

- Period 2000-2008:
The trade balance has seen a surplus over the years 2000-2008. The year 2008 recorded the largest surplus of + 2.522.986 million DZ when achieving exports estimated at 5.095.020 million DZ, the year 2002 the lowest surplus of + 544.152 million DZ with exports of 1.501.192 million DZ, and the period saw oil prices rise for the years 2000-2007 the economic recovery scheme and the global financial crisis in 2008.

- Period 2009-2021:

The trade balance experienced a surplus over the years 2009-2014, 2011 recorded the largest surplus of 1.931.630 million DZ with exports of 5.374.131 million DZ and 2014 the lowest surplus of 197.890 million DZ with exports of 4.917.598 million DZ to see the deficit phase for 2015-2020. -1.877.060 million DZ with exports estimated at 3.277.716 million DZ, the lowest deficit in 2018 at -513.954 million DZ with exports of 4.889.279 million DZ, To achieve a surplus in 2021 estimated at 219.733 million DZ with exports estimated at 5.404.713 million DZ due to controlling the value of imports and seeking to raise the value of exports outside the burning sector The coronavirus pandemic and OPEC's agreement to reduce oil production to strike a balance.

Tools and methods to test the impact of exports on Algeria's balance of trade for the period 1991-2021:
The study on the Algerian economy, in connection with the test of the impact of exports on the balance of trade, is being conducted by drawing on the database of the National Statistical Office and the World Bank during the period 1991-2021 using the jointly integrated test of Johansson, the causation test of Granger, the normal boxing method and based on the Eviews 9 programme.

5- Method, model and study variables:

The data of the study are exports, balance of trade, inflation, oil prices, for the period from 1991 to 2021 according to an estimated 31 annual views, introducing the Nepalese logarithm to make the chains homogeneous.

We present the standard study to test the impact of exports on Algeria's balance of trade during the period 1991-2021, drawing on previous economic theories and applied studies to estimate the model in its mathematical form as follows:

Lintbd = f (Linexe, Lininf, Linppr) …… …… (01)
This takes the following mathematical form:
…….. (02) $lintbd_t = \beta_0 + \beta_1 linexe_t + \beta_2 lininf_t + \beta_3 linpprf_t + \varepsilon_t$
Where:

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$\boldsymbol{lintbd_t}$: Logarithm trade balance is represented by the export-to-import division product which is the dependent variable.
$\boldsymbol{linexe_t}$: Logarithm exports is one of the independent variables.
$\boldsymbol{lininf_t}$:: Logarithmic inflation is an independent variable.
$\boldsymbol{linppr_t}$: Logarithm oil price is an independent variable.
$\boldsymbol{\varepsilon_t}$: Limit random error.

Noting that we have divided exports by imports because logarithms are not applied to negative values, we are in deficit if the divide is less than 1 surplus case if it is greater than 1.

Statistical Tests:
Before estimating the standard models, it is necessary to analyze the characteristics of the time chains in question to see whether they are stable or not and to determine their degree of integration, since instability is the origin of the false results, and to study stability we rely on tests for the unitary root of the stability of the chains.

Our most important is the Dickie Fuller Developer Test (ADF), the Filips-Perone Test (PP) as a teacher correction of Dickie Fuller's test statistics, to eliminate the biases resulting from what characterizes random oscillations, and to take into account the conditional discrepancy of errors.

We also address Johansson's simultaneous integration method, the causation test for Grager, and the normal micro-square method.

Johansson Simultaneous Integration Test:
The long-term relationship between time series is characterized by the phenomenon where fluctuations in one series tend to offset fluctuations in the other, eventually leading to stabilization or fixed relationship between their values over time. Achieving a common integration requires integrating the time series of the same degree. Any residual integration resulting from the estimated zero-degree relationship between them is crucially examined through tests such as the Johansen test. This test provides insights into the cointegration, aiding in understanding the underlying relationship between the time series.

Causal Test Study for Granger:
Granger's causation test is used to ascertain that there is a feedback or exchange relationship between variants in the form of chronological series data. A variable is a reason if information is included that has to be expected for another variable.

Normal Micro Squares Method:
The linear regression model is multiple if we have more than one independent variable, and the regression model is interested in estimating the effect between a quantitative variable, the dependent variable, and two or more quantitative variables, the independent variable.

The model produces a linear statistical equation that can be used to explain the relationship between the dependent variable and the autonomous variables or to estimate the value of the dependent variable when determining the value of the autonomous variables. Multiple linear regression analysis is interested in studying and analyzing the impact of the autonomous variables on the dependent variable, and the best method of estimation is the normal micro-squares method.

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6- Discussion and analysis of results:

Results of Stable Time Series Study:

Testing the stability of the chains during the period 1991-2021, aims to ascertain their age, and then know their degree of integration. From the table below, statistical results indicate by applying the expanded ADF test and PP test at a 5% morale level, and the critical values of the test, that the chains are unstable because they contain a unitary root as long as the absolute value calculated is completely below the absolute value.

Table (02): Test results of stable thoughtful chains

Test Type	ADF Test			PP Test		
Test Form	(01)	(02)	(03)	(01)	(02)	(03)
Critical Value	-1.95	-2.96	-3.56	-1.95	-2.96	-3.56
Calculated Value TBD	-1.73	-1.87	-2.05	-1.69	-1.86	-2.04
Calculated value EXE	1.92	-1.88	-1.52	2.12	-2.04	-1.36
Calculated value INF	-1.63	-2.80	-2.68	-1.50	-2.68	-2.54
Calculated value PPR	2.52	-1.24	-1.82	0.64	1.16	-1.84

Source: Prepared by the researcher based on eviews9

Table (03): Stable Test Results of First-Class Discrepancies Chains

Test Type	ADF Test			PP Test		
Test Form	(01)	(02)	(03)	(01)	(02)	(03)
Critical Value	-1.95	-2.96	-3.56	-1.95	-2.96	-3.56
Calculated Value DTBD	-5.40	-5.29	-5.24	-5.03	-4.89	-4.78
Calculated value DEXE	-4.24	-4.95	-6.15	-4.17	-4.73	-5.00
Calculated value DINF	-7.68	-7.60	-7.68	-7.82	-7.78	-7.96
Calculated value DPPR	-4.87	-5.03	-4.99	-4.80	-4.81	-4.68

Source: Prepared by the researcher based on eviews9

The results of the table above also indicate that the first-class discrepancy chains are stable as the absolute value is completely greater than the critical value in absolute terms, which means that there is a common complementarity between the variables, and therefore we use Johannesen's method of joint integration.

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Joint Integration Method Test Results for Johansson:

And through appendix (01) to test the effect at P = 04 slowing point In the four lines, calculated values are greater than critical values at a 5% moral significance level, That is, we reject the hypothesis of nowhere where the number of integration rays = r + 1 This is reinforced by the results of the Great Premium Value Test, where it is clear in the four lines that the calculated value is greater than the critical value at a moral indication level of 5%, Which means a long-term balance between the balance of trade and exports, inflation, oil prices.

Table (04) shows that Model IV achieves the highest number of criteria for the required conditions, thus the delay factor p = 04.

Table (04): Slowdown coefficient test results in VAR model

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-0.688000	-0.550183*	-0.743736	5.59e-06	NA	13.66857
1	-0.166120	0.522965	-0.444802	7.68e-06	19.56853	25.78242
2	0.517983	1.758335	0.016355	1.35e-05	13.08340	35.78738
3	0.176910	1.968530	-0.547663	1.01e-05	23.33223	59.11961
4	-1.928472*	0.414416	-2.875990*	1.85e-06*	32.03187*	105.3879

Source: Prepared by the researcher based on eviews9

Results Estimate Normal Micro Squares Method:
Since the integration requirement is fulfilled, we can apply the normal micro-square method, according to appendix (02) we can estimate the model as follows:
DTBD = -0.084 + 0.519*DEXE - 0.033*DINF + 0.303*DPPR

Causal Relationship Test Results:

To determine the relationship between variables by table (04), which shows that Model IV achieves the highest number of criteria for achieving the required conditions, so the delay factor is p = 04, the results can be summarized in the Supplement (03), from which we conclude that there is no causal link in both directions of exports, inflation, oil prices to the balance of trade, nor from the latter to the rest of the above-mentioned variables, according to the odds greater than 5%, this is confirmed by Fischer's calculated statistics lower than Fischer's scheduled at 4 degree freedom for the numerator and 26 for the resident and 5% morale level.

Correlation Test Results:
It is also indicated that the linkage of the trade balance with exports and the rest of the variables, depending on the table of the association matrix shown in the table. (05), the correlation factors are generally very high and often exceed 50%, as the relationship between the balance of trade and ordinary exports is very high at 88% And it's also expulsive between it and oil prices at a very high rate of 85%, While it is a weak inverse between it and inflation and is estimated at 29% As exports and oil prices are as high as 90%, The inverse is weak between inflation and exports and oil prices at rates estimated at 21% and 19% respectively.

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Table (05): Balance of Trade Test Results Associated with Variables

	DTBD	DEXE	DINF	DPPR
DTBD	1.000	0.875	-0.286	0.852
DEXE	0.875	1.000	-0.207	0.901
DINF	-0.286	-0.207	1.000	-0.188
DPPR	0.852	0.901	-0.188	1.000

Source: Prepared by the researcher based on eviews9

Discussion and analysis of results:
The results are discussed and analyzed statistically and economically as follows:

Statistically discuss and analyze model test results:
Through the following statistical tests:

Static morale test for parameters: All the parameters of the model are immoral except exports and constant, through probability below 0.05. We also judge the morale of the parameter at α=0.05 morale level while t-student is greater than t scheduled and equal to:

$$t_{tabt}^{\alpha} = t_{n-k}^{0.05} = t_{31-4}^{0.05} = t_{27}^{0.05} = 1.703$$

The explanatory power of the model: Through the corrected determination coefficient equal to 0.7765 we say that 77.65% of the trade balance is explained by affiliate variables, and the remaining 22.35% of these changes are attributed to variables that do not exist in this model, with reference to the absence of self-correlation of errors and from which statistical estimate is acceptable.

The overall morale test of the model: By the probability value of the Fischer F test = 0.000000 below the indicator level of 0.05, we accept the hypothesis of having a coefficient that is at least morally different from zero, i.e. there is a total indication of the estimated model.

Testing the natural distribution of the protectors: To ensure that the requirement for the natural distribution of the preservatives is met, we used the Jarque-Bera test to find that the test result is equal to 0.978 less than the $x_{0.95}^{2} = 5.99$, meaning that the protector of the model follows the normal distribution as per Annex 04.

The DW of the model is 1.60 in the area of doubt. Therefore, the problem of self-association of errors must be detected in the following tests:

Self-correlation test for errors: by testing Breusch-Godfrey to ensure that there is no self-correlation between errors and is evidenced by the results of appendix 05 and by the probability values greater than 5% for lack of self-correlation between errors.

The homogenization of errors test: Without homogenization, biased results can be obtained in the balance of trade equation, so they must be available and we will use the ARCH self-degradation

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test, showing through the probability values respectively 0.40 and 0.36, which are greater than 0.05 at the 5% indication level, including the hypothesis of heterogeneity according to Annex 06.

According to Annex 07, this hypothesis can be ascertained using the WHIT test, where the probability values of the three statistics used in this test, the Fischer statistic, the Lagrong multiplier statistic and the annotated value statistic respectively are 0.43, 0.38, 0.84, which is greater than 0.05 at the 5% indicator level, and therefore we accept the homogenization hypothesis as well.

All the above supports the credibility of the above results in the relationship between the financial trade balance and exports.

Discussion and analysis of model test results economically:
Through the results of the assessment of the values of the parameters, we draw the following:

The fixed limit parameter value indicates that when the values of independent variables are nil, the balance of trade is at the limit of -0.083, which is morally (at the level of% 5) because its probability is less than 0.05.

The value of the export parameter is positive indicating that the impact of these labs was positive and moral (at the level of 5%) because their probability is less than 0.05, with the value of the parameter being 0.518, which means that if exports increase by 1%, the balance of trade will increase by 0.518%.

The negative inflation index value indicates that the impact of this coefficient was negative but immoral (at a level of 5%) because its probability is greater than 0.05, with a value of -0.033, which means that if inflation increases by 1%, the trade balance will decrease by 0.033%, which is economically acceptable.

The value of the oil price parameter is positive, indicating that the impact of these labs was positive and immoral (at the level of 5%) because their probability is greater than 0.05, with the value of the parameter being 0.302, which means that if oil prices increase by 1%, this will increase the trade balance because most Algerian exports are petroleum by 0.302%, which is economically acceptable.

8- CONCLUSION:

With this study, we tried to test the impact of exports on Algeria's trade balance for the period 1991-2021 using the instruments of the measurement economy by assessing the relationship between them, beginning with the conceptual theorem of them and confirming the relationship between them the process of analyzing the direction of their evolution during the period under consideration, and then moving on to studying the stability of time chains and testing the joint integration of Johansson in order to estimate the standard model among the variables in the normal micro-square manner, through Granger's causation test.

Results:
By studying the economic phenomenon and assessing its model, we have reached the following results:
- A long-term balance between the trade balance and economic variables.
- The results of the estimate showed that there was no causal link between the balance of trade and both exports, depending on Algeria's economic characteristics as an oil State with respect to the balance of trade.

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- We have a correlation between exports as well as oil prices and the balance of trade. There is also a correlation between it and inflation, which is in line with economic theory, since there is a strong correlation between oil prices and exports and thus the balance of trade.

We refer here to the specificity of Algeria's economy, characterized by:

- ✓ Algeria is a fully oil-dependent rent State that controls the balance of trade because of its fluctuating prices globally.
- ✓ High inflation rates.

Recommendations:

The following recommendations can be presented:

- ✓ Diversification of exports outside petroleum exports and balancing the balance of trade balance.
- ✓ Combating inflation and reducing its rates.
- ✓ Trying to create a real economy.
- ✓ Linking the State's fiscal policy to the economic aspect.

Expectations:

Prospects for the future study are:

- ✓ Application of the study by other economic methods and instruments;
- ✓ Application of Banel data to a group of Arab oil States;
- ✓ Selection of a type of export for a more partial study.

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Appendixes:

Annex (01): Johansson Joint Integration Test Results

Date: 11/21/23 Time: 22:57
Sample (adjusted): 1997 2021
Included observations: 25 after adjustments
Trend assumption: Linear deterministic trend
Series: DTBD DEXE DINF DPPR
Lags interval (in first differences): 1 to 4

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.862975	90.28775	47.85613	0.0000
At most 1 *	0.603564	40.59791	29.79707	0.0020
At most 2 *	0.465087	17.46688	15.49471	0.0249
At most 3	0.070422	1.825607	3.841466	0.1766

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.862975	49.68985	27.58434	0.0000
At most 1 *	0.603564	23.13102	21.13162	0.0258
At most 2 *	0.465087	15.64128	14.26460	0.0301
At most 3	0.070422	1.825607	3.841466	0.1766

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

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Annex (02): Estimate model by normal micro-squares

Dependent Variable: DTBD
Method: Least Squares
Date: 11/24/23 Time: 17:48
Sample (adjusted): 1992 2021
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.083855	0.026404	-3.175834	0.0038
DEXE	0.518659	0.192344	2.696521	0.0121
DINF	-0.033467	0.027524	-1.215915	0.2349
DPPR	0.302670	0.181339	1.669086	0.1071

R-squared	0.799672	Mean dependent var	-0.015862
Adjusted R-squared	0.776557	S.D. dependent var	0.260617
S.E. of regression	0.123193	Akaike info criterion	-1.226561
Sum squared resid	0.394590	Schwarz criterion	-1.039735
Log likelihood	22.39842	Hannan-Quinn criter.	-1.166794
F-statistic	34.59562	Durbin-Watson stat	1.602087
Prob(F-statistic)	0.000000		

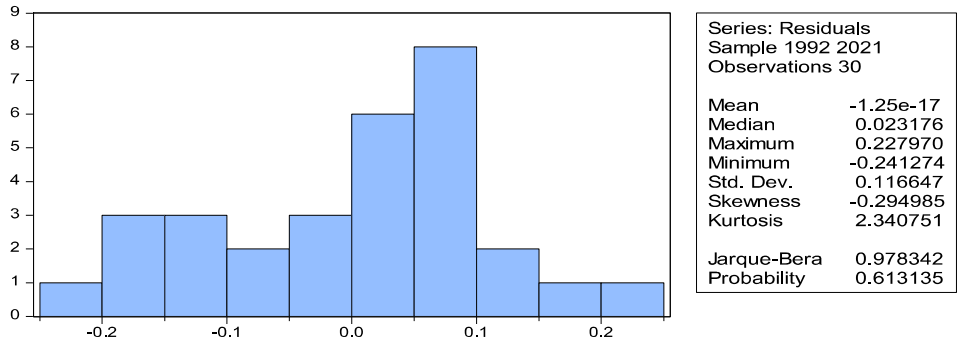
Annex (03): Granger Causal Test Results

Pairwise Granger Causality Tests
Date: 11/22/23 Time: 18:36
Sample: 1991 2021
Lags: 4

Null Hypothesis:	Obs	F-Statistic	Prob.
DEXE does not Granger Cause DTBD	26	0.10477	0.9793
DTBD does not Granger Cause DEXE		0.11919	0.9738
DINF does not Granger Cause DTBD	26	0.81031	0.5357
DTBD does not Granger Cause DINF		0.85133	0.5123
DPPR does not Granger Cause DTBD	26	0.75891	0.5661
DTBD does not Granger Cause DPPR		0.05999	0.9927
DINF does not Granger Cause DEXE	26	0.90599	0.4825
DEXE does not Granger Cause DINF		0.56230	0.6932
DPPR does not Granger Cause DEXE	26	0.53689	0.7106
DEXE does not Granger Cause DPPR	ر	0.06864	0.9906
DPPR does not Granger Cause DINF	26	1.45910	0.2581
DINF does not Granger Cause DPPR		0.47364	0.7545

P-ISSN: 2204-1990; E-ISSN: 1323-6903

Annex (04): Results of the natural distribution test of errors using (jaque-bara)



Annex (05): Self-correlation test results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.320079	Prob. F(4,22)	0.8615
Obs*R-squared	1.649871	Prob. Chi-Square(4)	0.7998

Annex (06): ARCH Test for Heterogeneous Error Differentiation Hypothesis

Heteroskedasticity Test: ARCH

F-statistic	1.046083	Prob. F(4,21)	0.4073
Obs*R-squared	4.319853	Prob. Chi-Square(4)	0.3644

Annex(07): WHITE TEST FOR Heterogeneous Error Differentiation Hypothesis

Heteroskedasticity Test: White

F-statistic	1.049494	Prob. F(9,20)	0.4379
Obs*R-squared	9.623333	Prob. Chi-Square(9)	0.3818
Scaled explained SS	4.845602	Prob. Chi-Square(9)	0.8476

Source: Prepared by researchers based on eviews9